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heating a mixture of hydrogen and oxygen gases in a rapid thermal process chamber at a temperature of at least about 450 °C and for a duration which increases the oxygen content of the dielectric film, said steam provided in a ratio of at least 0.005 relative to other gases present in the rapid thermal process chamber, wherein the ratio of hydrogen to oxygen gases in the mixture is in the range of about 0.1 to about 0.8, and wherein the pressure of said rapid thermal process chamber is less than atmospheric pressure; and

subjecting the dielectric film to a heat treatment in an ambient comprising a stabilizing gas selected from the group consisting of N₂, O₂, O₃, NO, and N₂O.

42. (twice amended) A method of fabricating a semiconductor device comprising:

depositing an oxygen-deficient dielectric film having a dielectric constant of at least about 25 over an underlying layer;

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subjecting the dielectric film to a wet oxidation with steam process provided by heating a mixture of hydrogen and oxygen gases in a rapid thermal process chamber at a temperature of at least about 450 °C and for a duration which increases the oxygen content of the dielectric film, said steam provided by a catalytic system in a ratio of at least 0.005 relative to other gases present in the rapid thermal process chamber, and wherein the pressure of said rapid thermal process chamber is less than atmospheric pressure; and

subjecting the dielectric film to a heat treatment in an ambient comprising a stabilizing gas selected from the group consisting of N₂, O₂, O₃, NO, and N₂O.

43. (twice amended) A method of fabricating a semiconductor device comprising:

depositing an oxygen-deficient dielectric film having a dielectric constant of at least about 25 over an underlying layer;

subjecting the dielectric film to a wet oxidation with steam process provided by heating a mixture of hydrogen and oxygen gases in a rapid thermal process chamber at a temperature of at least about 450 °C and for a duration which increases the oxygen content of the dielectric film, said steam provided by a pyrogenic system in a ratio of at least 0.005 relative to other gases present in the rapid thermal process chamber, and wherein the pressure of said rapid thermal process chamber is less than atmospheric pressure; and

subjecting the dielectric film to a heat treatment in an ambient comprising a stabilizing gas selected from the group consisting of N₂, O₂, O₃, NO, and N₂O.

44. (twice amended) A method of fabricating a semiconductor device comprising:

depositing an oxygen-deficient dielectric film having a dielectric constant of at least about 25 over an underlying layer;

subjecting the dielectric film to a wet oxidation with steam process in a rapid thermal process chamber at a temperature of at least about 450 °C and for a duration which increases the oxygen content of the dielectric film, said steam provided by a bubbled water vapor system in a ratio of at least 0.005 relative to other gases present in the rapid thermal process chamber, and wherein the pressure of said rapid thermal process chamber is less than atmospheric pressure; and

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subjecting the dielectric film to a heat treatment in an ambient comprising a stabilizing gas selected from the group consisting of N₂, O₂, O₃, NO, and N₂O.

45. (amended) A method of fabricating a semiconductor device comprising:

depositing an oxygen-deficient dielectric film having a dielectric constant of at least about 25 over an underlying layer;

subjecting the dielectric film to a wet oxidation anneal process consisting of steam provided by heating a mixture of hydrogen and oxygen gases in a rapid thermal process chamber at a temperature of at least about 450 °C and for a duration which increases the oxygen content of the dielectric film, and wherein the pressure of said rapid thermal process chamber is less than atmospheric pressure; and

subjecting the dielectric film to a heat treatment in an ambient comprising a stabilizing gas selected from the group consisting of N₂, O₂, O₃, NO, and N₂O.

46. (amended) A method of fabricating a semiconductor device comprising:

depositing an oxygen-deficient crystalline dielectric film having a dielectric constant of at least about 25 over an underlying layer;

subjecting the crystalline dielectric film to a single wet oxidation anneal process with steam provided by heating a mixture of hydrogen and oxygen gases in a rapid thermal process chamber at a temperature of at least about 750°C to about 950°C and for a duration which increases the oxygen content of the crystalline dielectric film; and

subjecting the crystalline dielectric film to a heat treatment in an ambient comprising a stabilizing gas selected from the group consisting of N₂, O₂, O₃, NO, and N₂O.

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47. (amended) A method of fabricating a semiconductor device comprising:

depositing an oxygen-deficient non-crystalline dielectric film having a dielectric constant of at least about 25 over an underlying layer;

subjecting the non-crystalline dielectric film to a single wet oxidation anneal process with steam provided by heating a mixture of hydrogen and oxygen gases in a rapid thermal process chamber at a temperature of at least about 450°C to about 750°C and for a duration which increases the oxygen content of the non-crystalline dielectric film; and

subjecting the non-crystalline dielectric film to a heat treatment in an ambient comprising a stabilizing gas selected from the group consisting of N₂, O₂, O₃, NO, and N₂O.

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